

**SURFACE PLASMON RESONANCE SYSTEMS AND METHODS HAVING A  
VARIABLE CHARGE DENSITY LAYER**

ABSTRACT OF DISCLOSURE

5           A device for detecting the presence of a member of a specific binding pair in a sample includes a substrate and a variable charge density layer having a surface adjacent to the substrate and a surface remote from the substrate. A first member of a specific binding pair is on the surface of the variable charge density layer remote from the substrate. The first member interacts with a second member of the specific binding pair present in a sample. The  
10       variable charge density layer has a charge carrier density that can be changed by the application of light and/or an electric field, so that a plasmon band is produced by a reflected light source impinging on the variable charge density layer.